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IP AUTHORITY, LLC
RAMRAJ SOUNDARARAJAN
4821A Eisenhower Ave
Alexandria, VA 22304

EXAMINER	
MORRISON, JAY A	

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RAM@IP-AUTHORITY.COM
brandi@ip-authority.com

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/711,808
Filing Date: October 06, 2004
Appellant(s): KLEEWEIN ET AL.

Ramraj Soundararajan
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7/9/2008 appealing from the Office action mailed 3/3/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,957,236	GANESH_et al.	10-2005
6,516,320	ODOM et al.	2-2003
7,007,027	NAJORK et al.	2-2006
6,584,459	CHANG et al.	6-2003

(9) Grounds of Rejection

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 26-32,34-45 and 47-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganesh et al. ('Ganesh' hereinafter) (Patent Number 6,957,236 B1) in view of Odom et al. ('Odom' hereinafter) (Patent Number 6,516,320 B1) and further in view of Najork et al. ('Najork' hereinafter) (Patent Number 7,007,027).

As per claim 26, Ganesh teaches

A computer-based method to version a node ... and locate a versioned node ... in a storage architecture managing node ..., said computer-based method implemented in computer readable program code stored in computer memory, said computer- based method comprising the steps of: (see abstract and background)

a. receiving a node modification request for a node ... from a database system; (transaction to modify, column 8, lines 26-30)

b. versioning said node … by copying, to a storage, a node … to which said node modification request is to be made and labeling said copied node … with an identifier; (copy loaded, column 4, lines 61-65; version information, column 4, lines 41-54)

and d. outputting said located labeled node. (column 2, lines 58-62)

Ganesh does not explicitly indicate "c. locating said labeled node … via said identifier and a hash on said node"

However, Odom discloses "c. locating said labeled node … via said identifier and a hash on said node" (dynamic hash, column 4, lines 45-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "c. locating said labeled node … via said identifier and a hash on said node" would have given those skilled in the art the tools to improve the invention by increasing the speed of access. This gives the user the advantage of not having to wait long periods for results.

Neither Ganesh nor Odom explicitly indicate "range".

However, Najork discloses "range" (range, column 2, lines 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom and Najork because using the steps of "range" would have given those skilled in the art the tools to improve the invention by allowing quick access to many nodes. This gives the user the advantage of more efficient access to nodes.

As per claim 27,

said identifier is any of the following: a timestamp or a LSN. (column 4, lines 41-54)

As per claim 28, Ganesh teaches

said storage is a transient storage. (column 4, lines 61-65)

As per claim 29, Ganesh teaches

said node modification request is any of the following: a node insertion request, a node update request, or a node deletion request. (column 8, lines 26-30)

As per claim 30, Ganesh teaches

said method is implemented across a network. (column 12, lines 2-13)

As per claim 31, Ganesh teaches

said network is any of the following: a local area network, a wide area network, or the Internet. (column 12, lines 2-13)

As per claim 32,

Ganesh does not explicitly indicate "said node … are associated with hierarchical node data that is derived from any of: a structured document, a computer network, or a directory file system."

However, Odom discloses "said node ... are associated with hierarchical node data that is derived from any of: a structured document, a computer network, or a directory file system" (column 8, lines 57-66).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "said node ... are associated with hierarchical node data that is derived from any of: a structured document, a computer network, or a directory file system" would have given those skilled in the art the tools to improve the invention by allowing many different structures to be used. This gives the user the advantage of being able to utilize the method on a variety of structures.

Neither Ganesh nor Odom explicitly indicate "ranges".

However, Najork discloses "ranges" (range, column 2, lines 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom and Najork because using the steps of "ranges" would have given those skilled in the art the tools to improve the invention by allowing quick access to many nodes. This gives the user the advantage of more efficient access to nodes.

As per claim 34, Ganesh teaches

A computer-based method to version a node ... and to locate a versioned node ... in a storage architecture managing node ... via a node id ... index, said each node assigned a node id value and a set of nodes forming a node ..., each entry in said node

id … index pointing to a node … and its … identifier, RID, said computer-based method implemented in computer readable program code stored in computer memory, said method comprising the steps of: (see abstract and background)

a. receiving a node modification request for a …; (transaction to modify, column 8, lines 26-30)

b. versioning said … associated with said node modification request by shadowing nodes in said … based on RID and assigning a time identifier to copies of said …; (copy loaded, column 4, lines 61-65; version information and time, column 4, lines 41-54)

c. locating a node in said shadowed … via said time identifier and RIDs; (column 2, lines 50-62)

and d. outputting said located node. (column 2, lines 58-62)

Ganesh does not explicitly indicate "to a Version Hash Table".

However, Odom discloses "to a Version Hash Table" (dynamic hash, column 4, lines 45-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "to a Version Hash Table" would have given those skilled in the art the tools to improve the invention by increasing the speed of access. This gives the user the advantage of not having to wait long periods for results.

Neither Ganesh nor Odom explicitly indicate "range".

However, Najork discloses "range" (range, column 2, lines 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom and Najork because using the steps of "range" would have given those skilled in the art the tools to improve the invention by allowing quick access to many nodes. This gives the user the advantage of more efficient access to nodes.

As per claim 35,

said time identifier is any of the following: timestamp or LSN. (column 4, lines 41-54)

As per claim 36,

new readers, after a modification, access current nodes through a new RID. (column 4, line 61 through column 5, line 8)

As per claim 37,

previous readers access old nodes via the same RID ... to locate the shadowed copy. (column 4, line 61 through column 5, line 8)

Ganesh does not explicitly indicate "and hashing the same RID ... in said Version Hash Table."

However, Odom discloses "and hashing the same RID ... in said Version Hash Table" (column 4, lines 45-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "and

hashing the same RID … in said Version Hash Table" would have given those skilled in the art the tools to improve the invention by increasing the speed of access. This gives the user the advantage of not having to wait long periods for results.

As per claim 38,

when modifications cause nodes in a … to be moved to a new RID, previous readers are redirected from the new RID to an old RID (column 4, line 61 through column 5, line 8).

Ganesh does not explicitly indicate "via a Redirection Hash Table."

However, Odom discloses "via a Redirection Hash Table" (column 4, lines 45-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "via a Redirection Hash Table" would have given those skilled in the art the tools to improve the invention by increasing the speed of access. This gives the user the advantage of not having to wait long periods for results.

Neither Ganesh nor Odom explicitly indicate "range".

However, Najork discloses "range" (range, column 2, lines 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom and Najork because using the steps of "range" would have given those skilled in the art the tools to improve the invention by

allowing quick access to many nodes. This gives the user the advantage of more efficient access to nodes.

As per claim 39,

when modifications cause nodes in a … to be moved to a new RID, previous readers are redirected from the new RID to an old RID via an index that describes where old versions are (column 4, line 61 through column 5, line 8).

Ganesh does not explicitly indicate "in said Version Hash Table."

However, Odom discloses "in said Version Hash Table" (column 4, lines 45-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "in said Version Hash Table" would have given those skilled in the art the tools to improve the invention by increasing the speed of access. This gives the user the advantage of not having to wait long periods for results.

Neither Ganesh nor Odom explicitly indicate "range".

However, Najork discloses "range" (range, column 2, lines 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom and Najork because using the steps of "range" would have given those skilled in the art the tools to improve the invention by allowing quick access to many nodes. This gives the user the advantage of more efficient access to nodes.

As per claim 40,

said shadowed nodes are copied to a transient storage. (column 4, lines 61-65)

As per claim 41,

said method is implemented across a network. (column 12, lines 2-13)

As per claim 42,

said network is any of the following: a local area network, a wide area network, or the Internet. (column 12, lines 2-13)

As per claim 43,

for … deletions, the … being deleted is moved to reserved RID RIDFF. (column 4, lines 54-60)

Neither Ganesh nor Odom explicitly indicate "range".

However, Najork discloses "range" (range, column 2, lines 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom and Najork because using the steps of "range" would have given those skilled in the art the tools to improve the invention by allowing quick access to many nodes. This gives the user the advantage of more efficient access to nodes.

As per claim 44,

Ganesh does not explicitly indicate "a reader hashes a Redirection Hash Table on .sub.RIDFF to find a correct Version Hash Table entry."

However, Odom discloses "a reader hashes a Redirection Hash Table on .sub.RIDFF to find a correct Version Hash Table entry" (column 4, lines 45-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "a reader hashes a Redirection Hash Table on .sub.RIDFF to find a correct Version Hash Table entry" would have given those skilled in the art the tools to improve the invention by increasing the speed of access. This gives the user the advantage of not having to wait long periods for results.

As per claim 45,

Ganesh does not explicitly indicate "said node ... are associated with hierarchical node data that is derived from any of: a structured document, a computer network, or a directory file system."

However, Odom discloses "said node ... are associated with hierarchical node data that is derived from any of: a structured document, a computer network, or a directory file system" (column 8, lines 57-66).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh and Odom because using the steps of "said node ... are associated with hierarchical node data that is derived from any of: a structured document, a computer network, or a directory file system" would have given

those skilled in the art the tools to improve the invention by allowing many different structures to be used. This gives the user the advantage of being able to utilize the method on a variety of structures.

Neither Ganesh nor Odom explicitly indicate "ranges".

However, Najork discloses "ranges" (range, column 2, lines 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom and Najork because using the steps of "ranges" would have given those skilled in the art the tools to improve the invention by allowing quick access to many nodes. This gives the user the advantage of more efficient access to nodes.

As per claim 47,

said node modification request is any of the following: a node insertion request, a node update request, or a node deletion request. (column 8, lines 26-30)

As per claim 48,

This claim is rejected on grounds corresponding to the arguments given above for rejected claim 34 and is similarly rejected.

As per claim 49,

This claim is rejected on grounds corresponding to the arguments given above for rejected claim 26 and is similarly rejected.

Claims 33 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganesh et al. ('Ganesh' hereinafter) (Patent Number 6,957,236 B1) in view of Odom et al. ('Odom' hereinafter) (Patent Number 6,516,320 B1) and further in view of Najork et al. ('Najork' hereinafter) (Patent Number 7,007,027) and further in view of Chang et al. ('Chang' hereinafter) (Patent Number 6,584,459).

As per claim 33,

Neither Ganesh, Odom, nor Najork explicitly indicate "said structured document is an XML document."

However, Chang discloses "said structured document is an XML document" (column 3, lines 48-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Ganesh, Odom, Najork and Chang because using the steps of "said structured document is an XML document" would have given those skilled in the art the tools to improve the invention by improving interoperability. This gives the user the advantage of being able to use the format across platforms.

As per claim 46,

This claim is rejected on grounds corresponding to the arguments given above for rejected claim 33 and is similarly rejected.

(10) Response to Argument

With respect to the outstanding 35 U.S.C. 103 rejection of claim 26, and all claims which depend therefrom, Appellant argues that neither Ganesh, Odom, nor Najork teaches "storage architecture managing node ranges". In order to better understand how Najork teaches the node ranges, we examine the following citation:

> "A mechanism for performing a lookup operation with respect to a key, k, traverses the B-Tree and refers to the left-link handle, h_{left}, of a node to access a left sibling of the node if the key k is less than or equal to a value k_{min}>J stored in the node. Mechanisms are also provided for performing insert and delete operations, and the lookup, insert, and delete operations detect if the key range of an index node, A, does not-include the key k that the operation is trying to locate, and follow a handle A.h_{left} to the left sibling when k<=A.k_{min}. Note that a "node" may span multiple disk or storage blocks, and that links and version numbers may be logically associated with nodes as opposed to individual disk blocks." (column 2, lines 34-46)

Here we see that Najork teaches a B-tree structure, and understanding how this type of structure functions is critical to understanding how Najork teaches node ranges in the instant claims. Examining Figure 3C we see that Najork teaches index nodes (I1-I7) and data nodes (D1-D8). The index nodes only contain keys while the data nodes contain the entire data record including keys. The logic of the structure of a B-tree such as this is that the internal nodes contain multiple key values and pointers or links to other nodes. When you are traversing a B-tree structure to find a particular data node, you start at the root and find the pointer or link which lies between the key values within that node for your desired search key (the primary key which you would use to find the desired data node). This happens at every level of the B-tree until you find the desired data node. Respectfully, the key values on either side of the pointer or link at every level

of a B-tree define a range of nodes which lies beneath. At each level they ranges are split in smaller and smaller ranges until you reach the desired leaf or data node which contains the data. This is the entire function of a B-tree, to define ranges of nodes in order to determine traversal down to a leaf or data node (this creates very wide trees to reduce the number of time-expensive disk reads). Therefore, respectfully, it is submitted that Najork teaches the claimed node ranges. It is noted that multiple other arguments by Appellant are predicated simply on the fact that a node range is not taught, and it is respectfully submitted the above answer to these arguments is sufficient to answer these arguments.

The Appellant also argues that Najork's keys are not associated with node ranges and somehow map associations between a key and an employee number in an employee record. Respectfully, there is no reason to let such an argument about the data which is being managed within the B-tree structure distract from the actual functioning of the B-tree itself. As any skilled person in the art of computer science should know, the data nodes which exist in the sub-tree which exists at the link between two key values is a node range, where the node ranges are defined by the key values.

With respect to claim 34, the Appellant further argues that neither Ganesh, Odom, nor Najork teaches “range identifier, RID”. From the previous answer to the Appellants argument regarding “node ranges” we see that in order to define the range Najork uses key values. Respectfully, these key values read on the claimed range

identifier or RID, as is clear from the above explanation, and it is submitted therefore the Najork discloses the claimed range identifier or RID.

With respect to the outstanding 35 U.S.C. 103 rejection of claim 34, and all claims which depend therefrom, Applicant argues that neither Ganesh, Odom, nor Najork teaches "versioning by shadowing nodes in a range to a version hash table based on RID", specifically with regards to the node ranges and shadowing nodes element of the limitation not being taught by Najork or Ganesh. Respectfully, the nodes in a range and RID elements of this limitation are taught by Najork as explained above. Regarding shadowing nodes, the following citation by Ganesh teaches this limitation:

> "Thus, any transaction that requires access to the data block as it existed from time T10 up to, but not including time T30, can use this reconstructed first version of the data block." (column 5, lines 21-24)

Here we see that Ganesh teaches that there are different versions of the nodes are kept based on various times, which teaches the shadowing of nodes as claimed by the Appellant. Therefore, respectfully, the combination of the disclosed references teaches the claimed limitation.

With respect to the outstanding 35 U.S.C. 103 rejection of claim 34, and all claims which depend therefrom, Applicant argues that neither Ganesh, Odom, nor Najork teaches "assigning a time identifier to copies of said range" and "locating a node in said shadowed range via said time identifier and RIDs". The following citation from Ganesh is important in understanding how this limitation is taught:

> "Typically, database systems maintain such versioning information at the data block level of granularity, since that is the level of granularity at which versioning is performed. For example, some database systems maintain an INCLUDE TIME and an EXCLUDE TIME for each version of a data block. The INCLUDE TIME specifies the commit time of the most recently committed transaction whose changes are included in the version of the data block." (column 4, lines 44-51)
>
> "Thus, any transaction that requires access to the data block as it existed from time T10 up to, but not including time T30, can use this reconstructed first version of the data block."

From the first citation above Ganesh teaches that and INCLUDE TIME and EXCLUDE TIME is maintained for each version, therefore teaching the claimed assigning of a time identifier to copies of said range. From the second citation by Ganesh above, we see that transactions requiring access to a certain version of the data block as it existed at a certain time can use that particular version, which clearly teaches locating a node via a time identifier. The remaining limitations regarding node ranges and RID's are taught by Najork as shown above. It is therefore respectfully submitted that the combination of the noted references does in fact teach the claimed limitation.

Conclusion:

The references cited disclose the claimed methods and articles of manufacture for versioning, locating and managing node ranges. In light of the forgoing arguments, the examiner respectfully requests the honorable Board of Appeals and Interferences to sustain the rejection.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Respectfully submitted,

/Jay Morrison/

Jay Morrison, Assistant Examiner, AU 2168

September 19, 2008

Conferees:

/Tim T. Vo/
Supervisory Patent Examiner, Art Unit 2168

Eddie Lee, TQAS/Appeals Specialist, TC2100

/Eddie Lee/
Supervisory Patent Examiner, TC 2100